

2019

SPARTANS SOCIOMOBILITY CENTENNIAL SURVEY

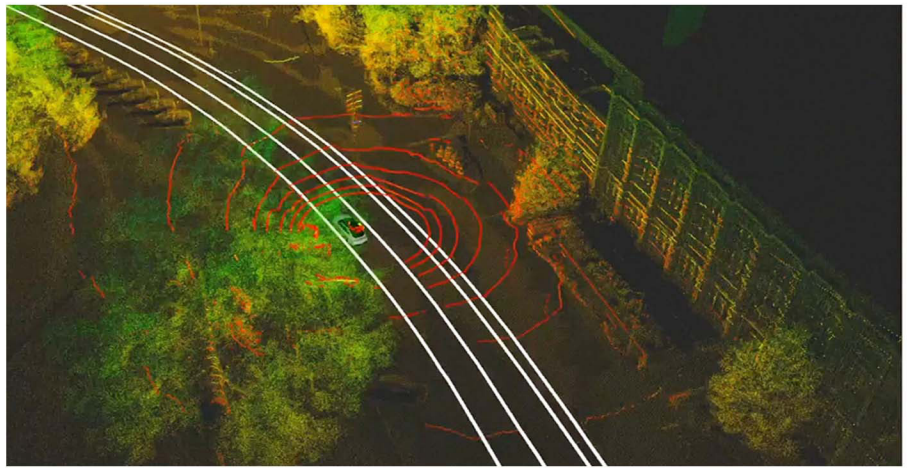
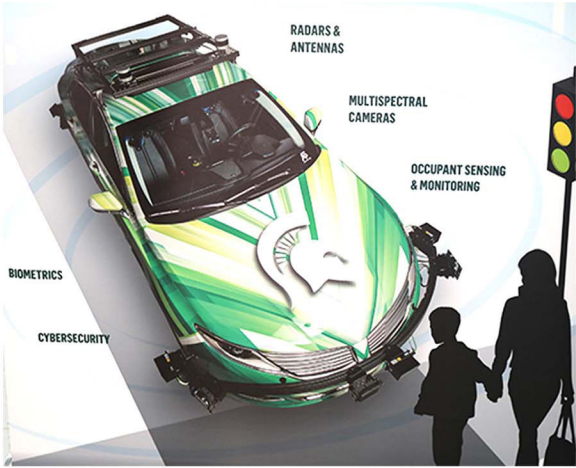
Report on MSU Community



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and Construction
MICHIGAN STATE UNIVERSITY

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Executive Summary

This report summarizes the results from the 2019 MSU Centennial Mobility Survey. The survey aims to:

- Understand current travel behaviors and mobility choices of all Spartans including staff, faculty, and students living on and off campus;
- Estimate the impact of free bus fare for on-campus trips;
- Understand the adoption and usage of emerging mobility choices including e-scooters and ride hailing (Uber or Lyft); and
- Gauge Spartans' attitudes towards Autonomous Vehicles and "smart campus" technology.

Understanding travel behaviors and mobility choices of Spartans will provide the information necessary to make the transport system at MSU safe, efficient, and sustainable. Knowing general attitudes regarding future mobility choices will help MSU make sound investment decisions and reach consensus across university communities.

The main findings are:



Commute and On-campus Trips

- Walking was the most popular choice to get around campus by all Spartans.
- Driving alone was the primary choice to get to campus by Spartans living off campus.
- Riding CATA bus to and around campus was a popular choice by students living both on and off campus.
- Carpooling to campus was equally likely among staff, faculty, and students living off campus, though not as popular as driving alone. However, staff were the most likely to carpool around campus.
- Biking to and around campus was more common by faculty and students than by staff.
- One in ten Spartans indicated a need for special accommodations.



CATA Bus

- The majority (70%) of Spartans who used CATA for their on-campus trips rode more often because of the free fare.
- About a quarter of free fare induced CATA trips would have been done by driving (driving alone, carpooling, Uber/Lyft, Taxi, and Zipcar).



Ride Hailing (e.g. Uber, Lyft)

- A small number (about 1%) of Spartans used ride hailing for their on-campus trips.
- On-campus ride hailing trips mostly replaced walking, bicycling, and transit trips.



Electric Scooter (e-scooter)

- A majority of e-scooter trips would have been done by walking, bicycling, or riding a bus.
- The overall adoption rate of e-scooters was about 14% in fall 2018.
- Most users rode e-scooters less than once per week.
- E-scooters were mostly used for trips to and from classes.
- The majority of e-scooter trips were under 10 minutes.



Autonomous Vehicles (AV)

- About half of Spartans thought they were familiar with AV.
- More Spartans had a positive rather than negative perception about AV.
- More than one third of Spartans were ready to take AVs when available on campus.



MSU as a “Smart Campus”

- About two thirds of Spartans were supportive of MSU investing in autonomous technologies.

MSU Centennial Mobility Survey

To understand the travel behaviors of Spartans and their perceptions of autonomous vehicles, a campus-wide survey was conducted during April and May 2019. The online survey was sent to all MSU faculty, staff, and students who commute to and reside on the East Lansing campus. Only those who worked and studied on campus during the fall semester of 2018 were selected for the survey because of two mobility events (free bus fare and e-scooters) surveyed. Respondents were informed that the survey was confidential and anonymous.

Survey Team

This report is the result of collaborative teamwork. The research team includes faculty from School of Planning, Design and Construction:

- Dr. Eva Kassens-Noor (Associate Professor, ekn@msu.edu),
- Dr. Tongbin Teresa Qu (Associate Professor, teresaqu@msu.edu),
- Dr. Mark Wilson (Professor, wilsonmm@msu.edu), and
- Dr. Zeenat Kotval-K (Assistant Professor, kotvalze@msu.edu).

The report team members and their responsibilities include:

- Dr. Tongbin Teresa Qu (Associate Professor), overall survey and report design;
- Wei Li (Master’s Degree in Urban and Regional Planning), report graphic design;
- Huiqing Huang (Graduate student in Urban and Regional Planning), survey data processing;
- Zachary Tecson (Bachelor’s Degree in Urban and Regional Planning), IRB process and online survey input; and
- Dan Seguin (Graduate student in Urban and Regional Planning), report proofread.

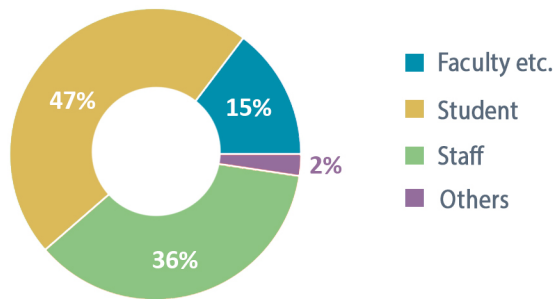
Acknowledgements

The survey team would like to thank Amy Butler (Campus Sustainability Director), Wolfgang Bauer (Associate Vice President for Administration), and Christine Carter (Office of the Executive Vice President for Administration) for their support to the survey and their help with disseminating the survey; Tim Potter (Sustainable Transportation Manager), Bill McConnell (Associate Professor), Adam Zwickle (Assistant Professor), and Grey Pierce (Assistant Director, UARC) for their help with proof reading and providing feedback; Tim Potter, Steve Troost (Campus Planner), and Stan Kaplowitz (Professor Emeritus) for sharing their knowledge about previous MSU mobility surveys. Last but not least, the survey team would like to thank Center for Business and Social Analytics (CBSA) for funding the survey.

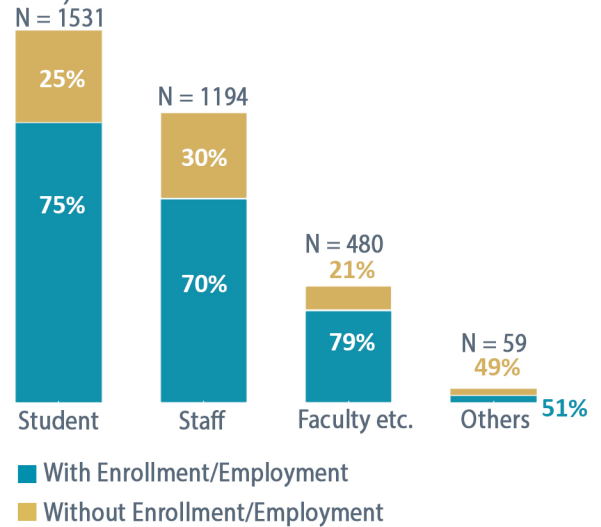


47% of respondents were MSU students, 36% of respondents were MSU staff, and 15% of respondents were faculty.

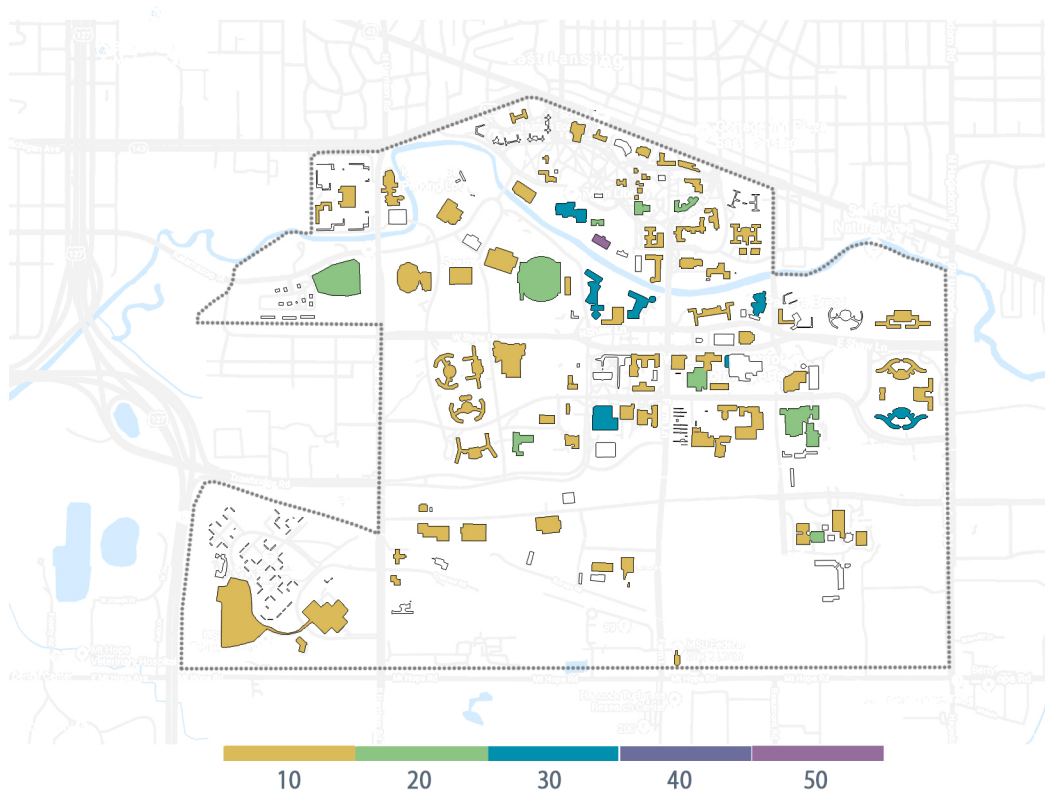
Which of the following best describes your current relationship with Michigan State University? (N= 3373)



Were you enrolled in courses or working on MSU East Lansing campus during fall 2018? (N= 3264)



Spatial distribution from staff and faculty respondents (N=770)

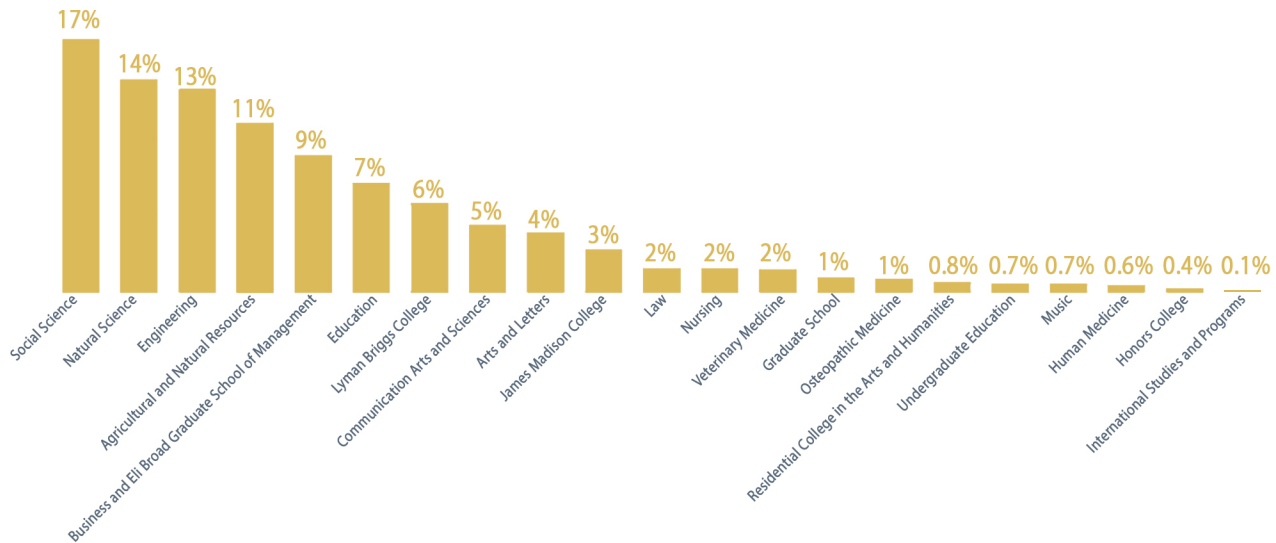


SURVEY PARTICIPATION



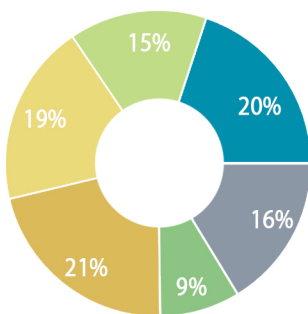
17% of students who took the survey were affiliated with Social Science, which had the highest participation among all colleges. **75%** of students who took the survey were undergraduates.

The responses of this section are from students.
Which college are you affiliated with? (N= 987)



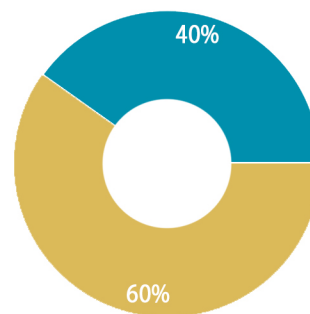
* Percentages may not sum to 100 due to rounding.

What is your class standing?
 (N = 1154)



- Freshman
- Sophomore
- Junior
- Senior
- Graduate (Master)
- Graduate (Ph.D.)

Did you live on or off campus in fall 2018?
 (N = 1147)



- On (N = 461)
- Off (N = 686)

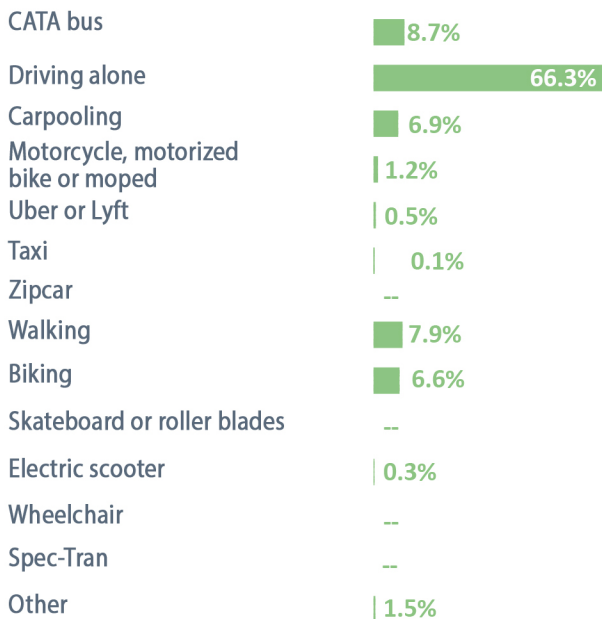
COMMUTE AND ON-CAMPUS TRIPS



Most Spartans chose to drive alone for their commute trips and walk for their on-campus trips. Students living on campus chose to walk and take CATA bus around campus.

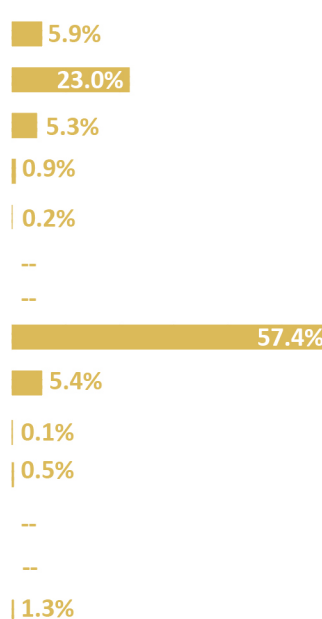
The responses of this section are from Spartans (faculty, staff, students) living off campus.

How do you typically get to campus? (Select up to two)



(N = 2423)

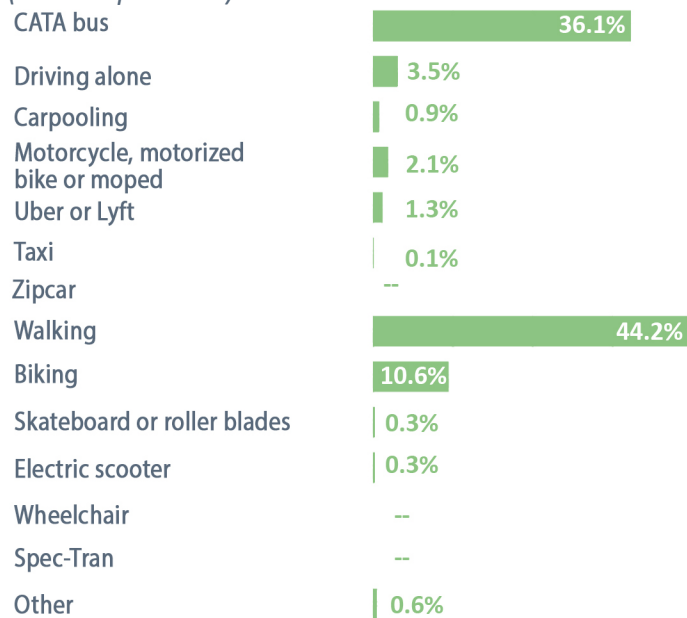
How do you typically get around campus? (Select up to two)



(N = 2440)

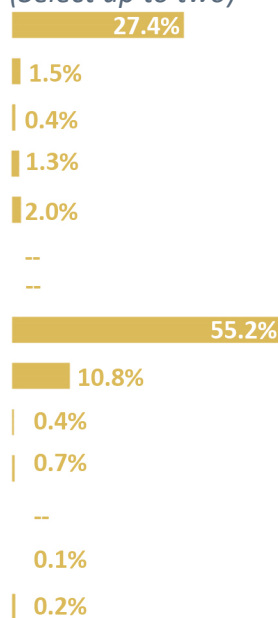
The responses of this section are from students living on campus.

How do you get to your first destination on campus? (Select up to two)



(N = 729)

How do you typically get around campus? (Select up to two)



(N = 798)

COMMUTE AND ON-CAMPUS TRIPS



Among Spartans living off campus, staff were the most likely to drive alone to campus. Faculty and students living off campus were the most likely to walk for their on-campus trips.

How do you typically get to campus?

(Select up to two)

	Staff	Faculty	Student Off-campus
CATA bus	1.5%	4.8%	19.8%
Driving alone	84.9%	68.3%	41.8%
Carpooling	6.1%	7.3%	7.6%
Motorcycle, motorized bike or moped	0.5%	0.7%	2.6%
Uber or Lyft	0.1%	0.8%	1.1%
Taxi	0.1%	--	0.1%
Zipcar	--	--	--
Walking	2.7%	6.5%	15.4%
Biking	3.3%	10.3%	8.5%
Skateboard or roller blades	--	--	--
Electric scooter	--	--	0.8%
Wheelchair	--	--	--
Spec-Tran	--	--	--
Other	0.9%	1.3%	2.3%
	(N = 839)	(N = 372)	(N = 661)

How do you typically get around campus?

(Select up to two)

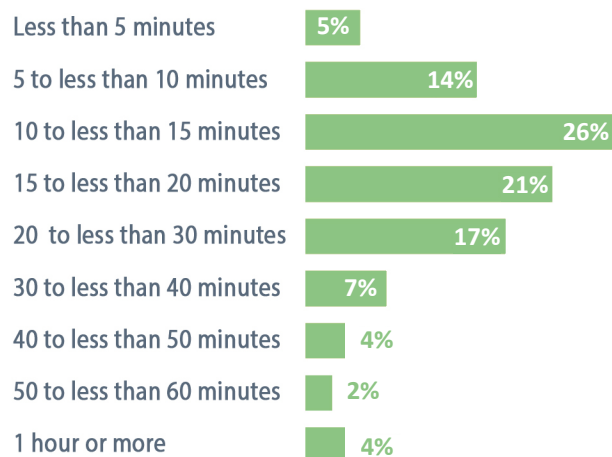
	Staff	Faculty	Student Off-campus
CATA bus	1.9%	2.7%	12.6%
Driving alone	33.8%	22.2%	9.7%
Carpooling	9.2%	3.6%	1.6%
Motorcycle, motorized bike or moped	0.3%	0.1%	2.1%
Uber or Lyft	--	0.4%	0.3%
Taxi	--	--	--
Zipcar	--	--	--
Walking	49.9%	62.6%	64.0%
Biking	2.6%	6.4%	8.1%
Skateboard or roller blades	--	--	0.3%
Electric scooter	0.3%	0.3%	1.0%
Wheelchair	--	0.1%	--
Spec-Tran	--	--	--
Other	1.9%	1.5%	0.4%
	(N = 834)	(N = 373)	(N = 657)

COMMUTE AND ON-CAMPUS TRIPS

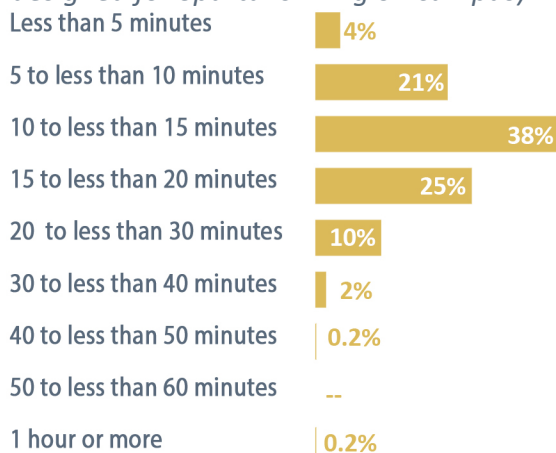


45% and 83% of Spartans living off campus were able to get to campus within 15 and 30 minutes respectively; 63% and 98% of students living on campus were able to make it to their first class within 15 and 30 minutes respectively.

How long does it typically take you to get to campus? (This question is designed for Spartans living off campus)



How long does it take to get to your first destination (not including residence hall) on campus? (Select up to two) (This question is designed for Spartans living on campus)



*Percentages may not sum to 100 due to rounding.

- **Driving alone** was the primary choice to get to campus for all Spartans living off campus.
- **Walking** was the most popular choice to get around campus for all Spartans.
- **Riding CATA bus** was popular for students living both on and off campus.
- **Carpooling** to campus was equally likely among staff, faculty and students living off campus.
- **Biking** to and around campus was more likely by faculty and students living on and off campus compared to staff.

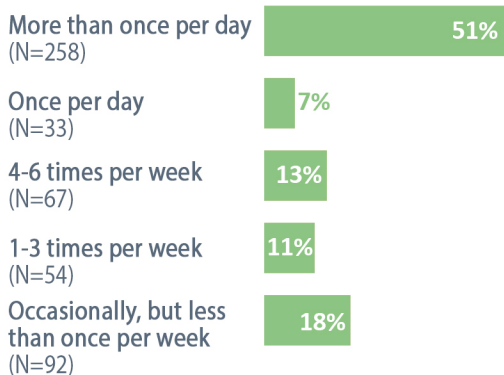
CATA BUS

This section summarizes the responses from Spartans who used CATA for their on-campus trips.

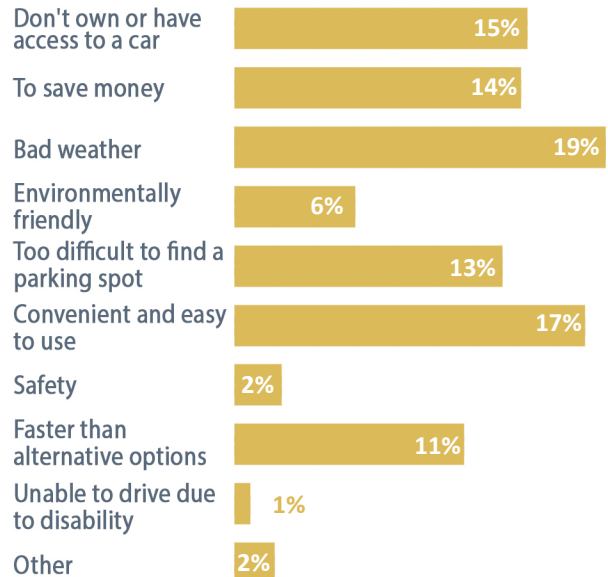


51% of Spartans who used CATA for their on-campus trips rode more than once per day. **70%** of Spartans who used CATA for their on-campus trips rode more often because of the free fare.

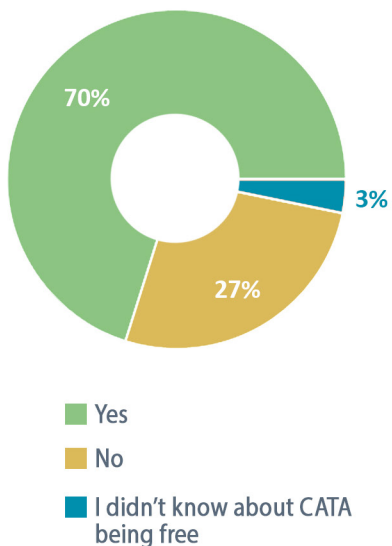
How often do you take the CATA buses? (N=504)



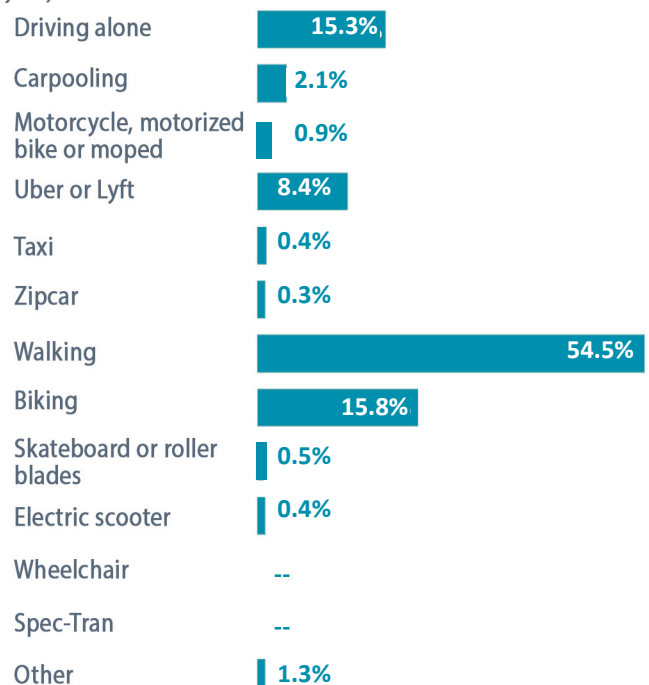
Why do you take the CATA bus over other modes? (N = 505) (select all that apply)



Have the rides being free resulted in you taking CATA buses more often? (N = 499) (As of fall 2018, all on-campus bus routes are free)



What modes of travel did it replace or reduce for you? (N = 344) (select all that apply) (if the previous question is yes)



*Percentages may not sum to 100 due to rounding.

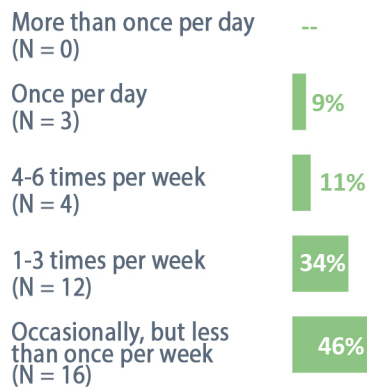
RIDE HAILING

This section summarizes the responses from Spartans who used ride hailing for their on-campus trips.

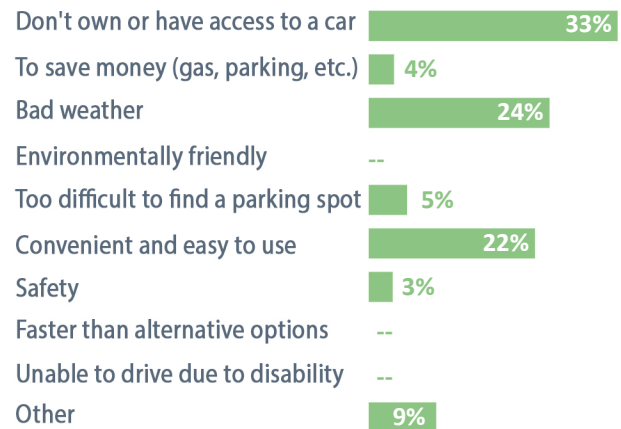


46% of Spartans who used ride hailing for their on-campus trips used it occasionally (less than once per week).

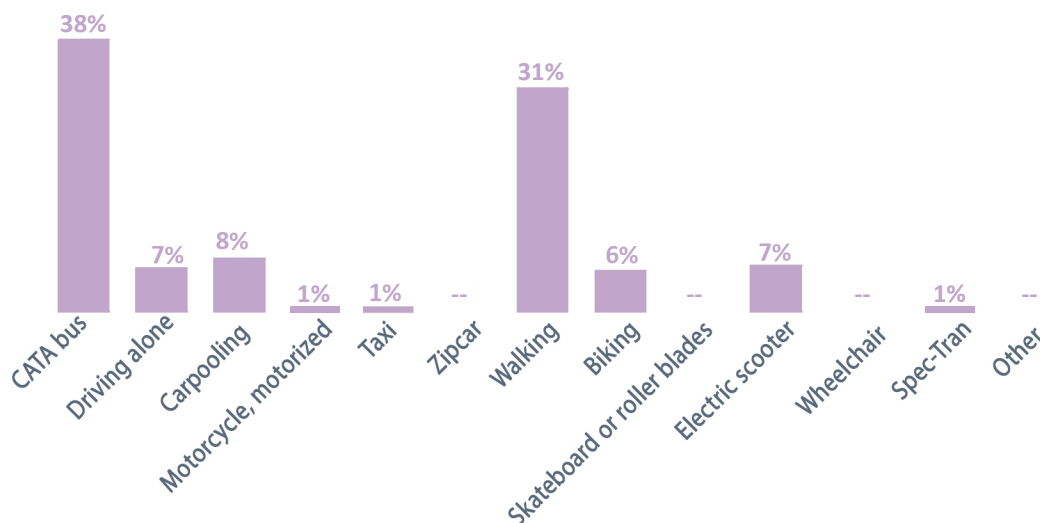
Generally, how often do you use ride hailing services? (N = 35)



Why do you take the ride hailing (Uber/Lyft) over other modes? (N = 35) (select all that apply)



For your ride hailing (Uber/Lyft) trips in general, what modes of travel would you have used if there were no ride hailing services? (N = 35) (select all that apply)



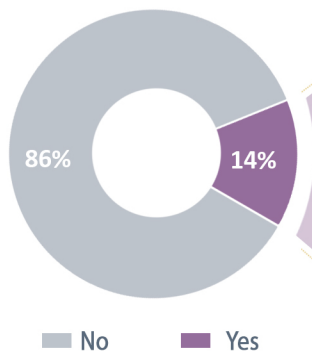
37% of ride hailing trips would have been done by walking or biking; **38%** of ride hailing trips would have been done by CATA bus.

ELECTRIC SCOOTER (e-scooter)

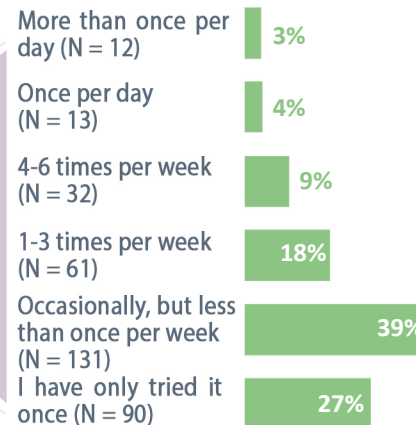


14% of Spartans rode e-scooters around campus during fall 2018; **66%** rode e-scooters **less than once per week**. E-scooters were mostly used for trips to and from classes.

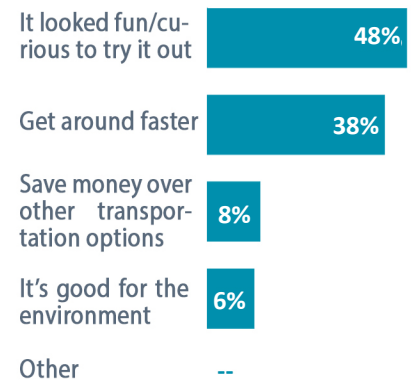
Have you ridden an e-scooter around campus during fall 2018? (N = 2372)



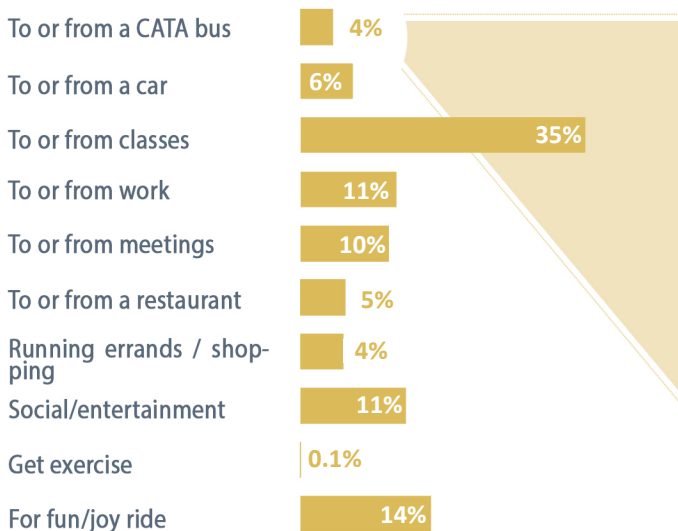
How often did you ride e-scooters in fall 2018? (N = 339)



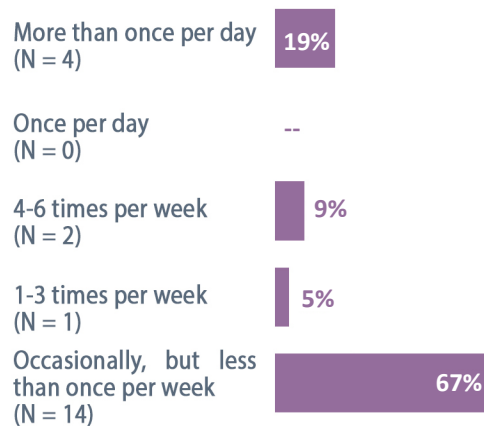
Why did you try e-scooters for the first time? (N = 336) (select all that apply)



What were the top three trip types for which you used the e-scooters? (N = 247)



How often did you use e-scooters to access CATA bus? (N = 21)



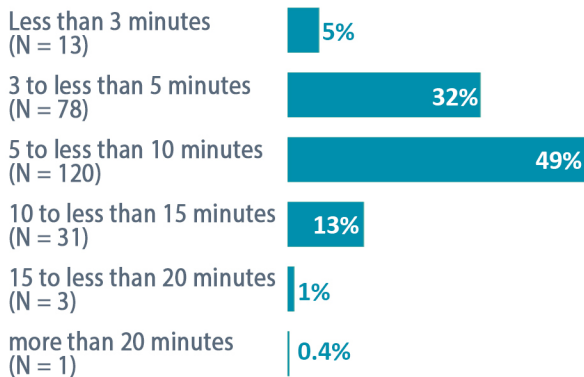
*Percentages may not sum to 100 due to rounding.

ELECTRIC SCOOTER (e-scooter)



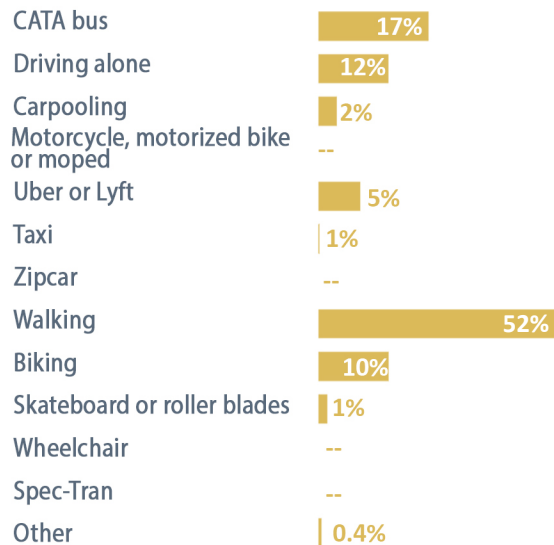
86% of e-scooter trips were less than 10 minutes. **69%** of e-scooter rides were on sidewalks.

How long were your e-scooter rides on average? (N = 246)



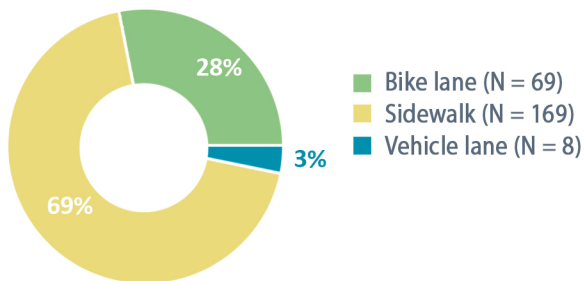
*Percentages may not sum to 100 due to rounding.

For your e-scooter trips in general, what mode of travel would you have used if there were no eScooters? (select all that apply) (N = 244)

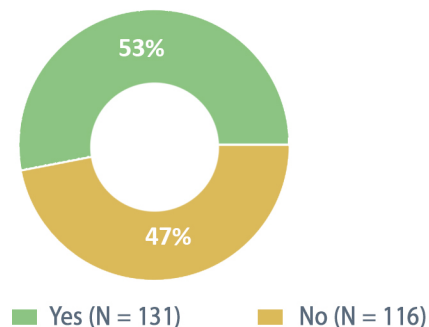


*Percentages may not sum to 100 due to rounding.

Where do you generally ride e-scooters? (N = 246)



Are you aware of any law or ordinance related to e-scooters in East Lansing area? (N = 247)



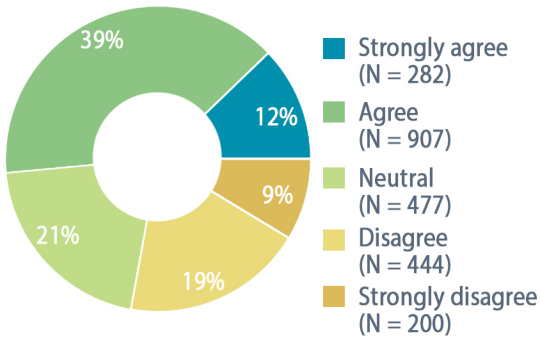
62% and **17%** of e-scooter trips would have been done by non-motorized modes (walking and biking) and transit respectively.

AUTONOMOUS VEHICLES (AV)

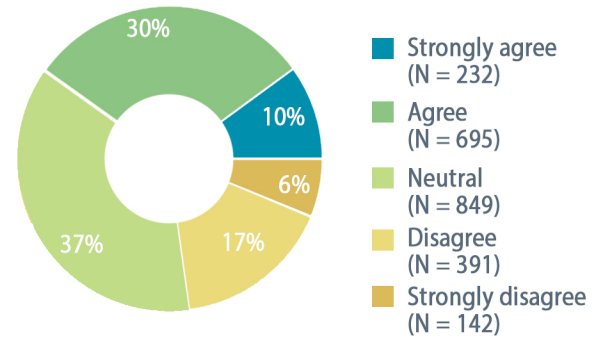


51% of Spartans thought they were familiar with autonomous vehicles. **40%** of Spartans held a positive attitude towards autonomous vehicles.

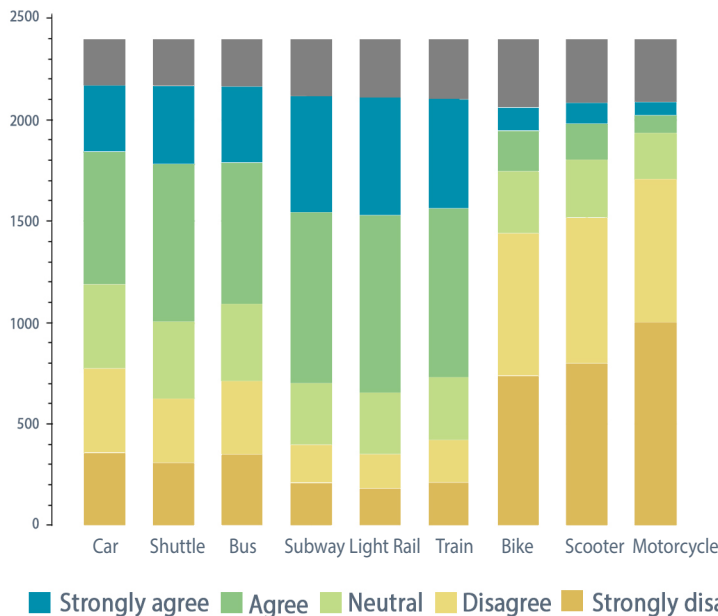
I would say that I am familiar with autonomous/self-driving vehicles.
(N = 2310)



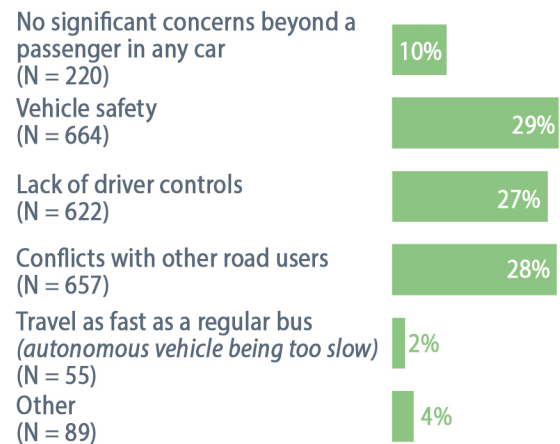
I would say that my perception about autonomous/self-driving vehicles is positive.
(N = 2309)



Suppose MSU was to introduce the following autonomous vehicles on campus. Please answer regarding your attitude. (N = 2402)



As a potential passenger in an autonomous vehicle, what would be your biggest concern? (N = 2307)

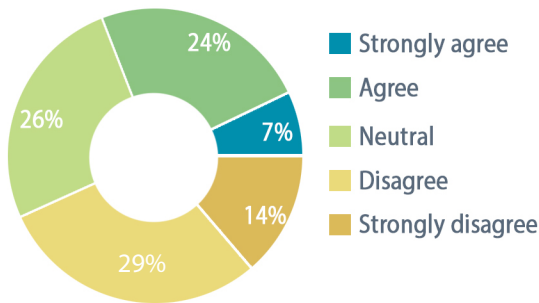


AUTONOMOUS VEHICLES (AV)

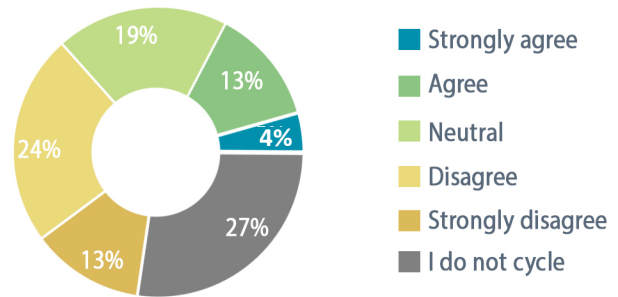


31% of Spartans felt safe about sharing roads with AV as pedestrians. **25%** of Spartans who cycle felt safe about sharing roads with AV as cyclists. **36%** of Spartans who drive felt safe about sharing roads with AV as drivers.

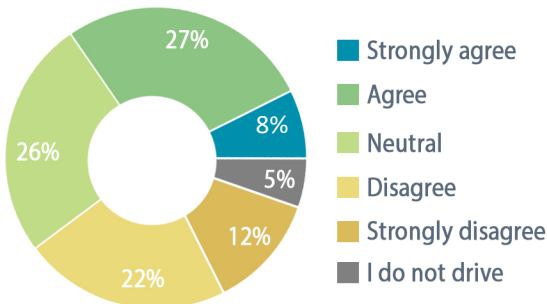
As a pedestrian, I would feel safe about sharing the roads with autonomous vehicles. (N = 2309)



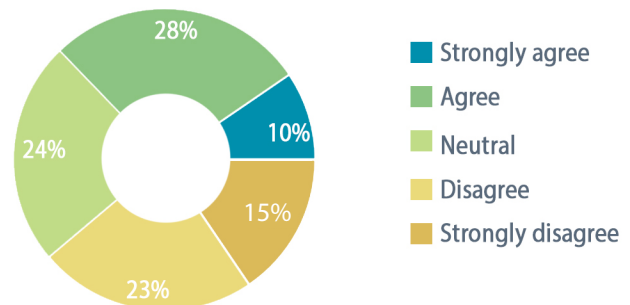
As a cyclist, I would feel safe about sharing the roads with autonomous vehicles. (N = 2309)



As a driver of a motorized vehicle, I would feel safe about sharing the roads with autonomous vehicles. (N = 2308)



I would consider replacing my current on-campus travel mode with an autonomous shuttle/pod (with comparable cost) when it is available on campus. (N = 2308)

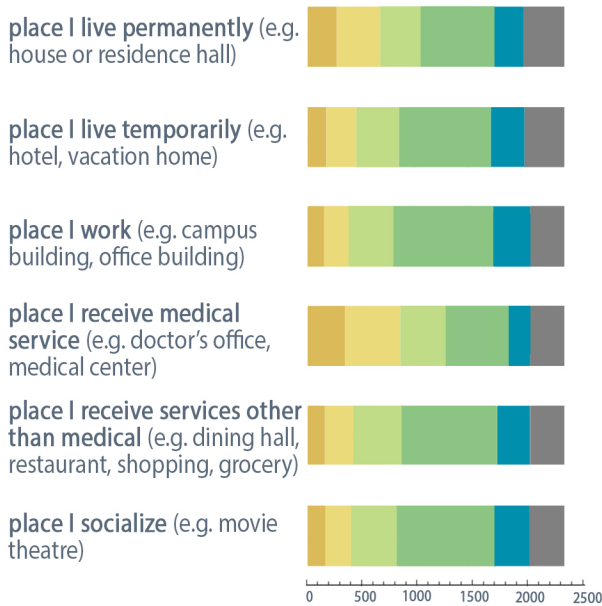


38% of Spartans were ready to take autonomous vehicles when available on campus.

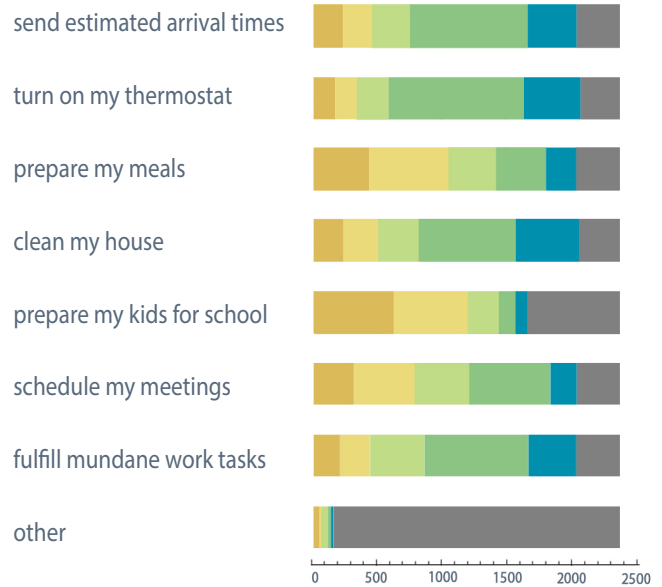


66% of Spartans were supportive of MSU investing in autonomous technologies, including vehicles.

I would feel comfortable in a fully autonomous... (N = 2402)

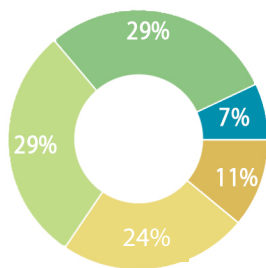


If my car and buildings including my house, my office, etc. could communicate, I would allow them to... (N = 2402)



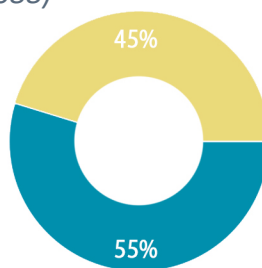
Legend: Strongly agree (blue), Agree (green), Neutral (light green), Disagree (yellow), Strongly disagree (orange), N/A: I don't know or I am not sure (grey)

I would be comfortable in a campus environment in which artificial intelligence regulates day-to-day operations. (N = 2184)



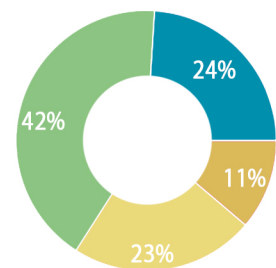
Legend: Strongly agree (N = 240), Agree (N = 637), Neutral (N = 641), Disagree (N = 513), Strongly disagree (N = 240)

Would you want autonomous technology to learn your morals OR shall it adopt society's ethics as governed by law or chosen by hundreds of thousands? (N = 2088)



Legend: Adopt (N = 945), Learn (N = 1143)

How supportive would you be of MSU investing in autonomous technologies including vehicles? (N = 2179)

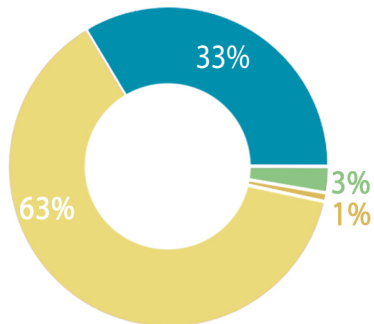


Legend: Very supportive (N = 523), Somewhat supportive (N = 914), Not too supportive (N = 498), Not at all supportive (N = 244)



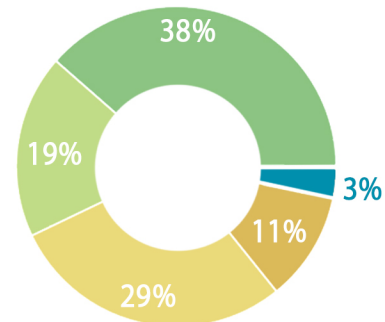
63% of respondents were female; **38%** of respondents were aged between 18 to 24, which was the largest age group.

What is your gender? (N = 2179)



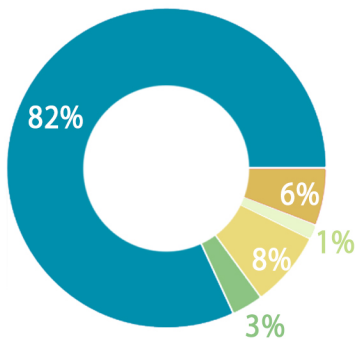
- Male (N = 732)
- Female (N = 1372)
- Other (N = 18)
- Prefer not to answer (N = 57)

What is your age? (N = 2166)



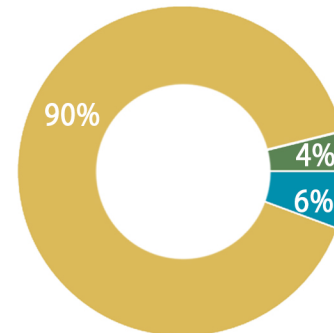
- 18 to 24 (N = 833)
- 25 to 34 (N = 402)
- 35 to 54 (N = 621)
- 55 to 64 (N = 240)
- Other (N = 70)

Which do you consider yourself? (N = 2147)



- Caucasian/White
- African-American/Black
- Asian
- Prefer not to answer
- Other

Are you of Hispanic/Latinx/Spanish origin? (N = 2127)

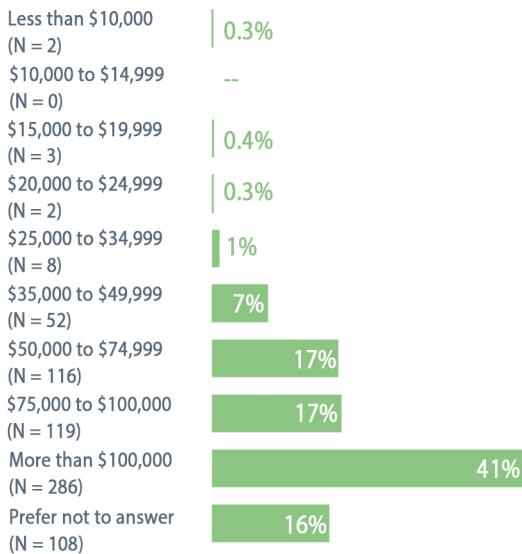


- No (N = 1924)
- Yes (N = 83)
- Prefer not to answer (N = 120)

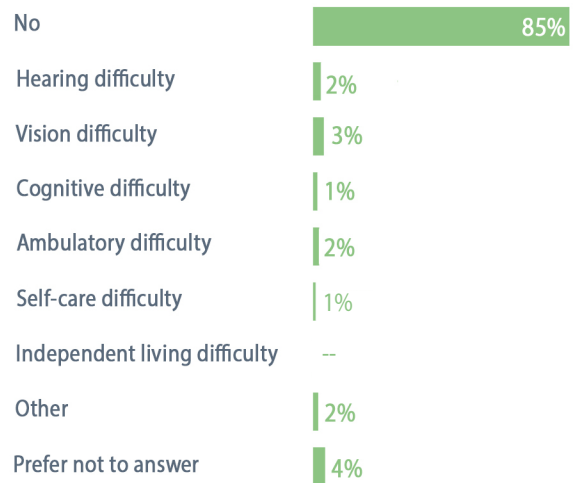


About **11%** of Spartans needed special accommodations.

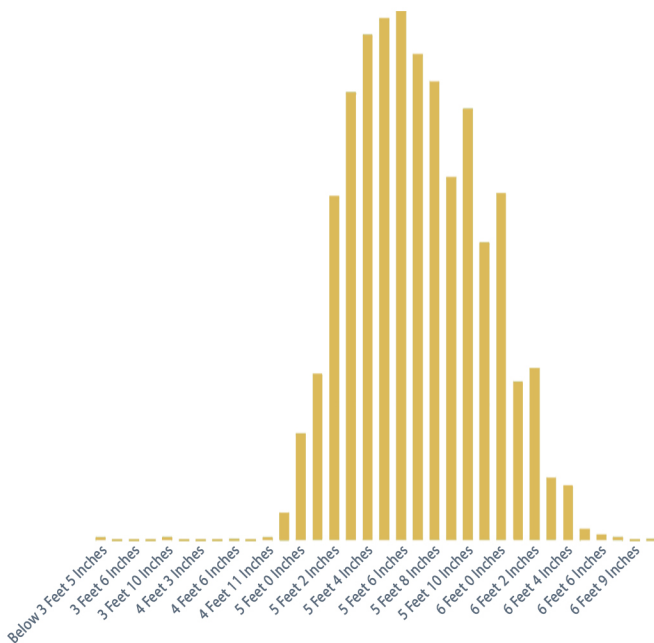
What is your total combined annual household income? (N = 696) (Staff and faculty only)



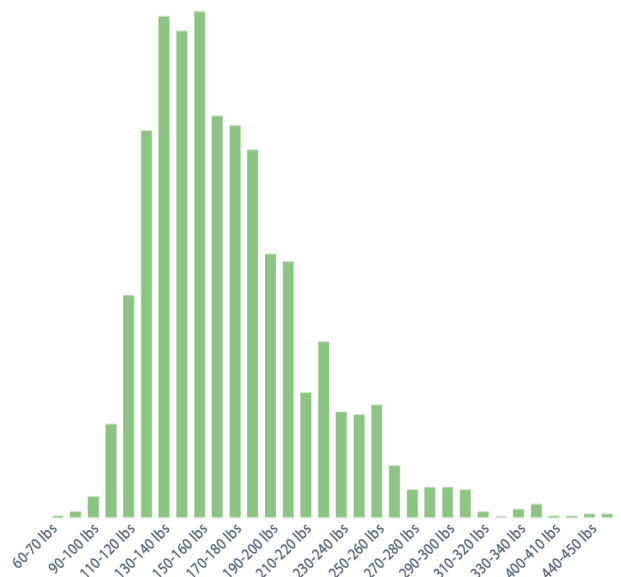
What accommodations, disabilities, or special needs do you require assistance with? (N = 2058)



What is your height (in feet and inches)? (N = 2051)



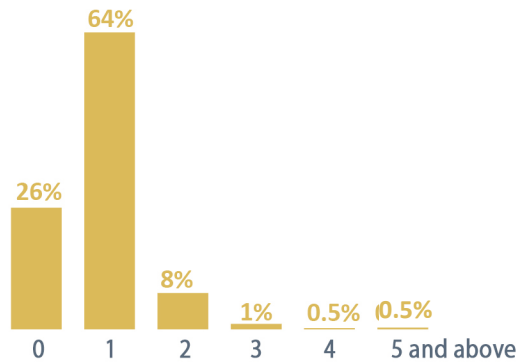
What is your weight (in pounds)? (N = 1967)



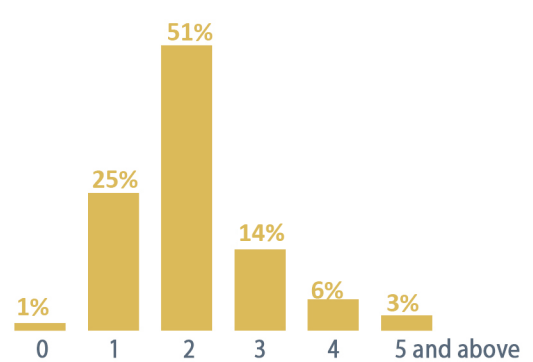


74% of students had at least one car. **99%** of staff and faculty households had at least one car.

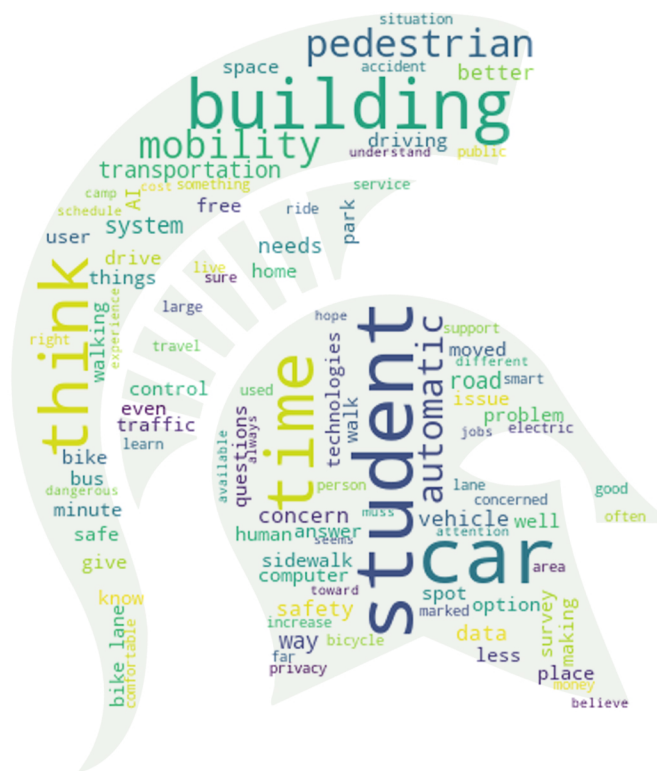
How many cars do you own? (N = 1012)
(Students only)



How many cars does your household own? (N = 722)
(Faculty and staff only)



Do you have any other comments about this survey or mobility on campus?





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